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10/076,154

02/14/2002

Yoshinori Hino

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EXAMINER

TRAN, TAN N

ART UNIT

PAPER NUMBER

2826

DATE MAILED: 05/06/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/076,154

Applicant(s)

HINO ET AL.

Examiner

TAN N TRAN

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on amendment filed on 04/09/03.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 19-33 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 22 is/are allowed.
- 6) ☒ Claim(s) 19-21, 23, 28-33 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 February 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☒ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Information Disclosure Statement

2. If applicant is aware of any relevant prior art, he/she requested to cite it on form PTO-1449 in accordance with the guidelines set forth in M.P.E.P. 609.

Priority

3. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Drawings

4. Figures 14,15,16 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Drawings

5. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, a pad portion as recited in claim 19 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Oath/Declaration

6. The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.

The oath or declaration is defective because:

It does not identify the mailing or post office address of each inventor. A mailing or post office address is an address at which an inventor customarily receives his or her mail and may be either a home or business address. The mailing or post office address should include the ZIP Code designation. The mailing or post office address may be provided in an application data sheet or a supplemental oath or declaration. See 37 CFR 1.63(c) and 37 CFR 1.76.

Claim Rejections - 35 USC § 112

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 19,20,29,30, are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

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In claim 19, line 5, "a lower wiring layer wiring disposed below the interlayer insulating film" is unclear as to whether it is being referred to a lower wiring layer wiring disposed in the interlayer insulating film.

In claim 23, lines 4,5, "the semiconductor region" lacks of antecedent basis;

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 19-21,30-33 are rejected under 35 U.S.C. 102(b) as being anticipated by Noto et al. (6,031,257).

With regard to claim 19, Noto et al. discloses an upper layer wiring 60b(60); a conductor layer 70b serves as a pad portion disposed above the upper layer wiring 60b(60); an interlayer insulating film 13 disposed below the upper layer wiring 60b(60); a lower layer wiring 50b(50) disposed below the interlayer insulating film 13; and a hole 12 in the interlayer insulating film 13, connecting the upper layer wiring 60 and the lower layer wiring 50, the hole 12 being formed not under but laterally spaced away from the pad portion 70b, wherein no hole 12 connecting the

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upper layer wiring 60 and the lower wiring 50 is formed under the pad portion 70b. (Note fig. 4 of Noto et al.).

With regard to claim 20, Noto et al. discloses a lower wiring 50b arranged under the bump electrode 25. (Note figs. 4, 22 of Noto et al.).

With regard to claim 21, Noto et al. discloses a semiconductor substrate 1; a gate oxide film 8 provided over the semiconductor substrate 1; a gate electrode 9 formed on the gate oxide film 8; a source/drain region 10 formed in the semiconductor substrate 1 and disposed adjacent to the gate electrode 9; a lower layer wiring 50 connected to the source/drain region 10 with contact; an interlayer insulating film 13 covering the lower layer wiring 50; a hole 12 formed in an interlayer insulating film 13; and an upper layer wiring 70b serves as a pad portion, disposed over the interlayer insulating film 13 and connected to the lower wiring through the conductor layer 70a and the hole 12; wherein no hole 12 connecting the upper layer wiring 70b and the lower wiring 50 is formed under the pad portion 70b. (Note fig. 4 of Noto et al.).

With regard to claim 31, Noto et al. discloses a semiconductor region formed under the gate electrode 9 and constituting a channel (Qp). (Note fig. 4 of Noto et al.).

With regard to claims 30,32,33, Noto et al. discloses a bump electrode 25 provided at the pad portion 70b. (Note fig. 22 of Noto et al.).

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 28,29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Noto et al. (6,031,257).

With regard to claims 28,29, Noto et al. discloses all the claimed subject matter except for the interlayer insulating layer is provided with additional holes to couple the upper wiring to the lower layer wiring. However, it would have been obvious to one of ordinary skill in the art to form the interlayer insulating layer is provided with additional holes to couple the upper wiring to the lower layer wiring in order to reduce the wiring.

Allowable Subject Matter

10. Claim 22 is allowable over the prior art of record, because none of these references disclose or can be combined to yield the claimed invention such as a low concentration region of the same conductivity type as the source/drain region formed extending shallowly to surface layer of the semiconductor under the gate electrode so as to connect the source/drain region and to contact the semiconductor region.

11. Claim 23 is would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Claim 23 is allowable over the prior art of record, because none of these references disclose or can be combined to yield the claimed invention such as the low concentration extends shallowly to a surface under the gate electrode to connect to the source/drain region and to contact a semiconductor region.

Response to Arguments

12. Applicant's arguments filed 04/09/03 have been fully considered but they are not persuasive.

It is argued, at page 6 of the remarks, that **"a hole in the interlayer insulating film, connecting the upper layer wiring and the lower wiring, said hole being formed not under but laterally spaced away from the pad portion.** The bolded feature is not disclosed, taught, or suggest by the cited prior art". However, fig. 4 of Noto et al. does show the hole 12 being formed not under but laterally spaced away from the pad portion 70b, wherein no hole 12 connecting the upper layer wiring 60b and the lower wiring 50b is formed under the pad portion 70b. Thus, Applicant's claim 19 does not distinguish over Noto et al. reference.

It is argued, at page 6 of the remark, that "there is no teaching or suggestion to incorporate the structure of Fig. 22 into the structure in Fig. 4 and vice versa". However, In response to applicant's argument that there is no teaching or suggestion to incorporate the structure of Fig. 22 into the structure in Fig. 4 and vice versa, the test for obviousness is not

whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the embodiments would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981). In this case, it would have been obvious to one of ordinary skill in the art to form the a bump electrode provided at the pad portion, in order to have electrical connection between the input/out cells and the integrated circuit

It is argued, at page 7 of the remarks, that **“a hole formed in an interlayer insulating film; and an upper layer wiring serves as a pad portion, disposed over the interlayer insulating film and connected to the lower wiring through the conductor layer and the hole; wherein no hole connecting the upper layer wiring and the lower wiring is formed under the pad portion.** Note et al. does not disclose the bolded features above as explained for claim 19”. However, fig. 4 of Noto et al. does show a hole 12 formed in an interlayer insulating film 13; and an upper layer wiring 70b serves as a pad portion, disposed over the interlayer insulating film 13 and connected to the lower wiring through the conductor layer 70a and the hole 12; wherein no hole 12 connecting the upper layer wiring 70b and the lower wiring 50b is formed under the pad portion 70b. Thus, Applicant’s claim 21 does not distinguish over Noto et al. reference.

Conclusion

13. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.


14. Any inquiry concerning this communication or earlier communication from the examiner should be directed to Tan Tran whose telephone number is (703) 305-3362. The examiner can normally be reached on M-F 8:30AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan Flynn can be reached on (703) 308-6601. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7724 for after final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

TT

April 2003


Minhloan Tran
Primary Examiner
Art Unit 2826